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## Retrospective Study

## Investigation of litigation in trauma orthopaedic surgery

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## Abstract

### BACKGROUND

It has been said that the number of orthopaedic claims has increased in the last few years. Investigation through the most prevalent cause would help to prevent further cases.

### AIM

To review the cases of medical complaints in orthopedic patients who had been involved in a traumatic accident.

### METHODS

A retrospective multi-center review of trauma orthopaedic-related malpractice lawsuits from 2010 to 2021 was conducted utilizing the regional medicolegal

database. Defendant and plaintiff characteristics along with fracture location, allegations, and litigation outcomes were investigated.

## RESULTS

A total of 228 claims referred to trauma-related conditions with a mean age of  $31.29 \pm 12.56$  were enrolled. The most common injuries were at hand, thigh, elbow, and forearm, respectively. Likewise, the most common alleged complication was related to malunion or nonunion. In 47% of the cases, the main problem that led to the complaint was the inappropriate or insufficient explanation to the patient, and in 53%, there was a problem in the surgery. Eventually, 76% of the complaints resulted in a defense verdict, and 24% resulted in a plaintiff verdict.

## CONCLUSION

Surgical treatment of hand injuries and surgery in non-educational hospitals received the most complaints. The majority of litigation outcomes were caused by a physician's failure to fully explain and educate the traumatic orthopedic patients and technological errors.

**Key Words:** Clinical negligence; Litigation; Medicolegal claims; Mismanagement; Patient satisfaction

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**Core Tip:** Given that orthopedics is ranked as the third most dangerous medical specialty by medical indemnity insurers, an investigation into it is necessary. Many of these complaints arose from a failure to adequately inform patients of the dangers and advantages of their treatment. Surgical treatment of hand injuries was the most complaints from patients in our study. The majority of litigation outcomes were caused by a physician's failure to fully explain and educate the traumatic orthopedic patients and a technological error. The remedies to these issues are knowledge, practical surgical expertise, and behavioral education.

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## INTRODUCTION

Clinical malpractice has enormous financial consequences for healthcare systems around the world, as well as a significant impact on patients and families[1]. Malpractice is described as professional responsibility resulting from insufficient medical care due to a lack of competence, neglect, or deception. Furthermore, medical liability is defined as the duty to rectify or settle the consequences of medical intervention from a penal, civil, or administrative perspective[2].

Trauma and orthopedic surgery have generally been viewed as a highly litigious specialty because of the volume of operations performed and the accompanying concerns if errors or complications happen [3,4]. Orthopedics is ranked as the third most dangerous medical specialty by medical indemnity insurers, after obstetrics and neurosurgery[5].

Surgeons are also susceptible to burnout because of a high number of medical complaints. The risk of a medical error will rise if burnout occurs for whatever reason, leading to increased patient complaints [6]. Therefore, to avoid burnout among surgeons who deal mostly with trauma cases, it is essential to identify the most common causes of medical complaints.

Orthopaedic patients can be divided into two categories: Traumatic and non-traumatic. These patients are treated in different settings and circumstances. Trauma patients may not adjust to their condition; therefore, their expectations of treatment may be out of line with their state. Many of these complaints arose from a failure to adequately inform patients of the dangers and advantages of their treatment, in addition to the fact that the treatment team may have performed medical malpractice[7,8].

Therefore, this study aimed to investigate the cases of medical complaints in orthopedic patients who had been involved in a traumatic accident.

## MATERIALS AND METHODS

### **Study design and participant selection**

In this retrospective multi center descriptive-analytical study, all litigations between March 2010 and March 2021 were studied using the medical councils of Kermanshah and Shiraz provinces. During the next step, the trauma orthopaedic claims were included for more detailed reviews.

We formally requested information about the involved orthopedist(s) and patient(s) as well as details about the alleged malpractice event. In terms of the event's characteristics, the type of hospital where it occurred (public *vs* private hospitals), the afflicted anatomical location, the clinical outcome of the case (death *vs* permanent impairment), and the final forensic decision on the claim (confirmed malpractice *vs* rejected malpractice).

Demographic data including gender, age, occupation, delineation of geographic areas, comorbidities, history of previous psychiatric disease, and cause of injury were collected.

### **Ethical consideration**

This study was conducted after obtaining permission from the Kermanshah University of Medical Sciences, Kermanshah, Iran. (IR.KUMS.REC.1399.1064). Data about claims are kept anonymous, and investigations are conducted in strict accordance with ethical standards and strictest confidence. Separating the data collector and analyst eliminated any individual bias in collecting and analyzing data. Additionally, the authors state that they have no conflicting interests during this study.

### **Statistical analysis**

Continuous variables are expressed as means and standard deviations. Categorical variables were provided as percentages, and the chi-square test was used with a statistical cutoff of  $P < 0.05$ . Statistical analysis was performed using SPSS software for Windows, version 25.0 (IBM corporation).

## RESULTS

Among the 938 Legal claims during the 10 years mentioned above, 322 were related to orthopedic issues. After reviewing the files one by one, a total of 228 claims referred to trauma-related conditions, fulfilled our inclusion criteria, and were enrolled in the study. **Figure 1** demonstrates the pathway of patient selection.

The mean age of the plaintiff was 31.29 years (SD: 12.56, range: 9-70). One hundred and four litigations were during the first half of the study period, while 124 were in the next, and no significant difference was found ( $P = 0.0879$ ). The average time between the operation and the claim registration was 11.58 ( $\pm 15.85$ ) mo, with a median of 6.5 mo. Furthermore, there were an average of 10.42 ( $\pm 6.38$ ) mo between the initial litigation and the final forensic decision. **Table 1** demonstrates the demographic features of the patients in our study.

As the **Figure 2** demonstrates, the most common injuries were at the hand, thigh, elbow, and forearm, respectively.

Based on our investigation, most of the alleged defendants' error is believed to be that the wrong treatment was chosen for patients (**Figure 3A**). Likewise, the most common alleged complication was malunion or nonunion, and the least was attributed to neurological insufficiencies and surgical site infection, respectively (**Figure 3B**).

During further investigations, we found that the most common chief complaint was attributed to post-operation complications (58%), prolonged treatment period (18%), malrotation (16%), reoperation need (5%), and persistent pain (3%).

According to the forensic reviews, in 47% of the cases, the main problem that led to the complaint was the inappropriate or insufficient explanation to the patient. In 53%, there was a problem with the surgery ( $P = 0.2006$ ).

Eventually, 76% of the complaints resulted in a defense verdict, and 24% resulted in a plaintiff verdict ( $P < 0.0001$ ).

## DISCUSSION

Our results indicate that the primary factor for patients to take action against orthopedic surgeons is the lack of sufficient explanation. Our results also indicated that the most alleged defendants' errors are a lack of proper decision-making. Based on our analysis, hand injuries[9] were the most common anatomic location of the complaint, with finger malalignment/rotation being the most frequently reported chief complaint. In our study, non-unions, malunions, limb length discrepancies, loss of movement, and residual deformities are the most common cases that are made legal statements against. according to our analysis, patients treated in educational hospitals were less likely to file complaints,

Table 1 Baseline data of the patients

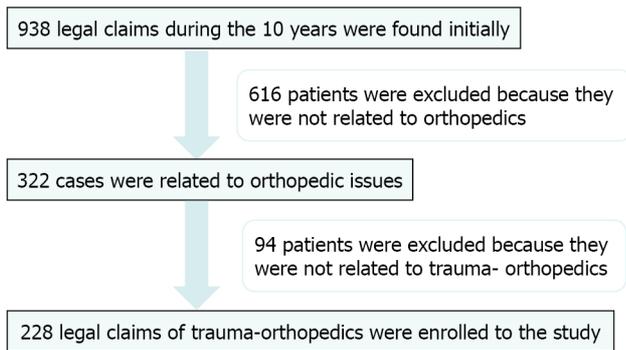
Variable	Frequency total = 228	<sup>a</sup> P
Gender		< 0.0001
Male	162	
Female	66	
Residence		0.0879
Urban	104	
Rural	124	
Occupation		0.1100
Heavy worker	54	
Lightworker	102	
Sedentary	48	
Unknown	24	
Comorbidities		< 0.0001
Yes	54	
No	174	
History of psychiatric disease		< 0.0001
Yes	12	
No	216	
Cause of injury		0.0110
Vehicle accident	156	
Falling down	6	
Occupational injury	42	
Injury at home	24	
Hospital of operation		0.2200
Government non-educational clinic	162	
Government educational clinic	12	
Private clinic	54	

<sup>a</sup>The *P* value shows the significance of the association between each variable and litigation by chi-square test.

even though these hospitals treated more patients, this fact has been highlighted in previous studies as well[10,11].

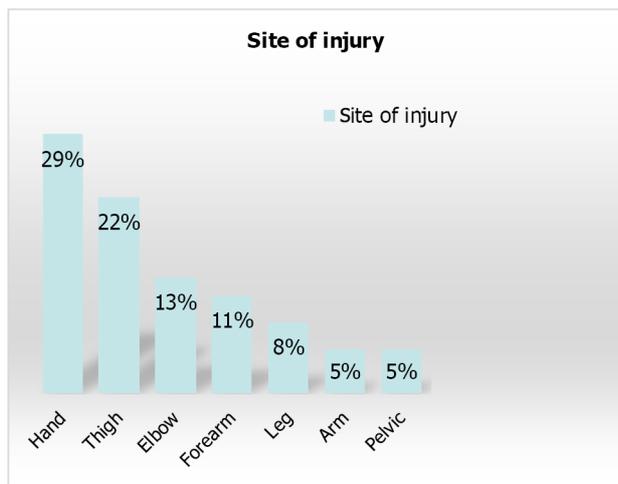
Fear of litigation causes changes in clinical practice and encourages the abuse of healthcare resources. According to published studies, this can lead to physicians ordering further lab data workup and radiography as a defense strategy against court suits[12,13]. Orthopedic surgeons' defensive medicine is a significant factor in health care costs with marginal benefit to patients[14]. Understanding the factors that influence litigation outcomes and the factors that generate litigation can help physicians take preventative measures to decrease future litigation risks.

Our assessments show that there has been no significant increase in the number of grievances. The prevalence of litigation claims in Iran is mainly dependent on the region, living conditions, and level of culture of the area in which data is gathered[15]. However, globally speaking, we should proceed with caution in this instance. There is an often-stated trend of increasing litigation cases, however, this trend remains controversial[16,17]. Cichos *et al*[16] conducted a study on national orthopedic settlement and verdict reports between 1988 and 2013. The results indicated a 215% growth in litigation frequency and also a 280% upturn in the settlement. Erivan *et al*[17] has also reported a rise in post-arthroplasty complaints between 2006 and 2016 from 0.2% up to 1.2%. on the contrary; a handful of studies indicate decreasing numbers of litigation. A recent study by Gathen *et al*[18] on an institutional legal database, including all litigations between 2000 and 2017 in a university teaching hospital has shown that significantly fewer litigations per 1000 cases were filed overall in 2009–2017 (65% less; *P* = 0.003) than in



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Figure 1 Flowchart of patient selection.



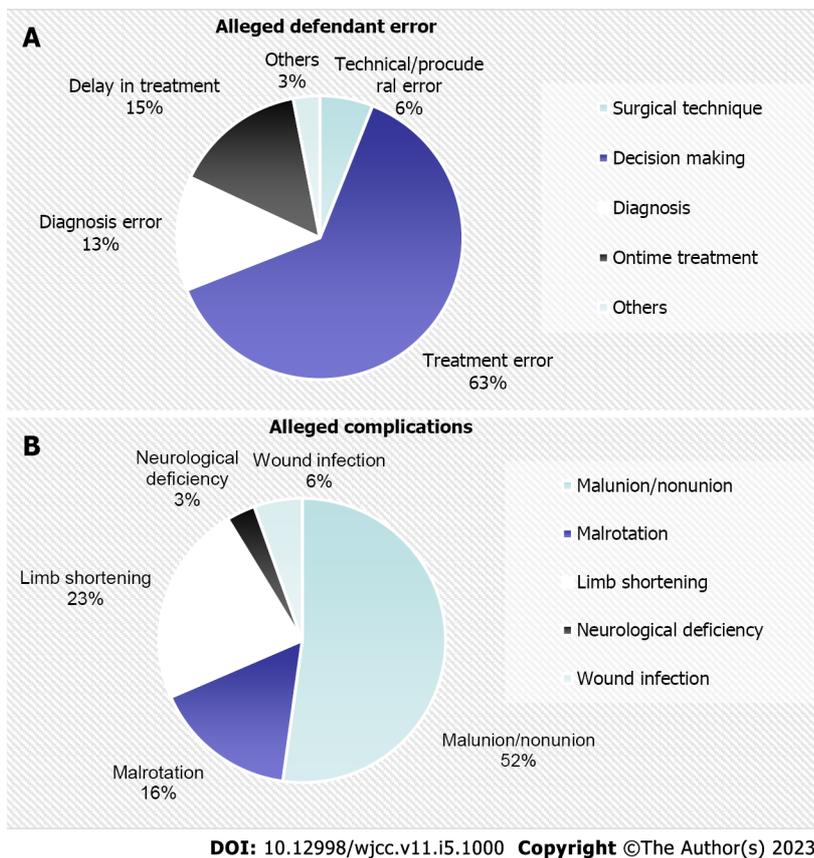
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Figure 2 The proportion of anatomic site of injury, hand injury was the most common.

2000–2008.

Our results indicated that hand complications were the highest, this is closely related to the negative impact it has on the patient’s occupational, social, and mental status. Mouton *et al*[19] reported a study on eighty claims of hand wounds, filed between 2007 and 2010 that most of the claims, the patient had major cutbacks on occupational and social activities. In a survey by Atrey *et al*[1], which reviewed 1473 trauma and elective cases of all orthopedic anatomical sites, the most common cause of chief complaint was hip. This gives us more areas to explore the origin of this finding in our study. According to a study by Sasor *et al*[20], on 430 cases related to hand surgery between 1989 and 2018, the most common reasons for negligence in forensic cases were Failure to diagnose/treat and surgical negligence. Physicians with subspecialty were significantly more likely to win cases which stresses the status of coordinated care in this matter. To avoid being accused of incompetence, surgeons may require a recommendation from other co-workers to validate surgical skills developed across a career. patients may rest easy knowing they are getting the best care possible from surgeons who are aware of their limitations and will refer them to specialists if necessary[21].

Our results indicated the most common problem leading to litigation was inappropriate or insufficient explanations in 47% of the cases. One of the most critical discussions with trauma patients is how to provide knowledge during this brief moment of trauma time to treatment, think about it, and make judgments based on that education. Performing a process that may be done optimally, effectively, and without regular execution of informed consent helps a lot in this case[22], as we discovered that slightly less than half of the complaints were due to a lack of appropriate explanation. Listening, accepting responsibility, apologizing, and doing all we can to make things right with the patient dramatically minimizes the chance of a malpractice lawsuit[23]. Many experts advise against this, and we realize this is contrary to what many people think is the best course of action in today’s society. To some, this may seem counterintuitive, but genuine remorse helps control the patient’s (or family members’) anger, and it also helps build a personal link between them[24]. It has been proven by Atrey *et al*[1] that improved communication skills, empathy, monitoring, and patient education can



**Figure 3** The proportion of the alleged defendant error and alleged complication. A: Alleged defendant error; B: Alleged complication.

significantly reduce the number of litigations. Just like in any other field, educating patients and building trust with them is critical[3].

The most common chief complaint leading to filed complaints was attributed to post-operation complications. The reported rate for complications in trauma surgery is 21.1%, with the incidence of error being 8.7%[25]. Stewart *et al*[23] has reported no significant difference while dealing with trauma patients compared with other surgical patients and stated the overall actual risk of a malpractice lawsuit to be low. But, when dealing with trauma patients, it is critical to plan ahead of time to avoid therapeutic mistakes, which have been the most common problem. Moreover, achieving the ideal condition and providing the necessary infrastructure[15] is necessary. Hospital infrastructure, surgical equipment, operating rooms, and orthopedic surgeons all play a role in determining the outcome of a patient's surgery[18]. Training for high-risk cases of patient complaints and ongoing training throughout practice is quite a beneficial matter[26]. Trauma surgeons' training needs to be more competency-based and behavioral training in dealing with problems and legal issues may fit through the programs; considering that most trauma surgeons are newly graduated, preventing these incidents is essential[18].

Finally, the amount of time it takes for a claim to be registered (6.5 mo) and the compensation made in favor of patients suffering negligence is considerably lower in our study than in developed countries. Understandably, these issues need further investigation to be clarified; the legal system is much involved in this matter. The amount of compensation may seem vague to be announced due to currency issues and inflation in our country[27]. This makes it difficult to analyze the effect of compensation claims in Iran compared to other countries and its effect as a patient safety indicator[28].

This study presents data from litigations occurring in two medical councils of Kermanshah and Shiraz provinces in Iran faced over a period of 11 years. Our study has limitations; one of the first limitations of our study was the possible disparities that could influence our data due to sources' origin. needless to say, we can use the findings of this study to help develop new policies in this instance. Another limitation due to currency concerns in our country, we cannot compare remuneration in successful claims in other research. Also, due to Freedom of Information Act restrictions, the study did not provide a more detailed clinical picture of individual claims.

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## CONCLUSION

Surgical treatment of hand injuries and surgery in non-educational hospitals received the most complaints from patients in our study. Most litigation outcomes were caused by a physician's failure to fully explain and educate the traumatic orthopedic patients and a technological error.

## ARTICLE HIGHLIGHTS

### **Research background**

Trauma orthopedic have been viewed as a highly litigious specialty because of the volume of operations performed and the accompanying concerns if errors or complications happen.

### **Research motivation**

Many complaints in trauma orthopedics arose from a failure to adequately inform patients of the possible adverse effect and advantages of their management. Therefore an investigation in the possible underlying cause of litigation may prevent their recurrence.

### **Research objectives**

To investigate the cases of medical complaints in orthopedic patients who had been involved in traumatic events

### **Research methods**

A retrospective review of trauma orthopedic malpractice from 2010 to 2021 was conducted utilizing the regional medico-legal database.

### **Research results**

A total of 228 claims referred to trauma-related conditions. The most common alleged complication was related to malunion or nonunion. In 47% of the cases, the main problem that led to the complaint was the inappropriate or insufficient explanation to the patient, and in 53%, there was a problem in the surgery.

### **Research conclusions**

Most litigation outcomes were caused by a physician's failure to fully explain and educate the traumatic orthopedic patients and a technological error.

### **Research perspectives**

The effect of fully explaining and educating traumatic orthopedic patients about the outcome and prevalence of litigation should be investigated.

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## FOOTNOTES

**Author contributions:** Khabiri SS designed and performed the research; Heidari MB and Ravandi Z designed the research and collected the data; Mosalamiaghili S and Jafari Kafiabadi M designed the research and contributed to the analysis and interpreted the result; Mirghaderi P, Biglari F, and Sabaghzadeh Irani A designed the research and drafted the manuscript; Salimi M designed the research and wrote the paper; Salimi M designed the research and edited significantly.

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